The Gwayakosijigan (Compass) Project

A food system mapping collaboration of the Fond du Lac Band of Lake Superior Chippewa and University of Minnesota Extension

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Executive Summary

In recent years, Native American communities in Minnesota have rallied around the widespread, societal health challenges of obesity, heart disease, and diabetes. Native communities recognize the rapid and alarming ascendance of these ailments -- which generally afflict Native communities at a greater proportion than the general population -- as an affront to some of the communities' strongest cultural institutions and, in some cases, as another trauma resulting from the incursion of non-Native ways of being. Tribal nutrition programs promote healthy food knowledge and preparation; garden programs encourage and support healthy food production; and community members employ varied means to showcase traditional food practices for staple foods central to cultural identity. These and other interventions to improve nutritional knowledge, cooking skills, and access to healthy foods have met with varying degrees of success, making next steps difficult to ascertain. This study was designed improve understanding the factors that play into *individual* food related decisions and behaviors; its purpose to inform future *community-scale* interventions related to health and food systems.

We led participants through a process of making personal food system maps and then followed up with those individuals to discuss their food-related actions and decisions. We learned that participants perceived that they were generally able to make decisions about food as they wished. Many participants emphasized the importance of natural, wild food sources and food procurement strategies as invaluable means to connect with nature, family, friends, and culture. Social and family networks were active when tangible or financial resources were limited. Indeed, for those who felt limited in their food decisions, financial constraints posed the greatest barrier, followed by constraints related to owned assets, such as food preparation equipment or vehicles. Moreover, grief, loss, and other life stresses often interfered with individual's ability to strategize and adapt to financial or other limitations.

Our preliminary results suggest several key directions for future inquiry and programming. This study was based on participant's perceptions; future assessment should strive to determine whether community members' desired food choices are, in fact, healthy. Also, relatively high availability of healthy foods in the area suggests that creation of new food access venues is unlikely to change eating habits without additional, related interventions. Finally, participant comments suggest that culturally relevant food production and procurement represent a feasible frame for food and nutrition education and that major life phase changes offer opportunities for accessing interested community members.

Core Team Members

(Listed alphabetically)

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Background

Native American communities across the United States are mobilizing rapidly to address the effects of societal health trends within Tribal communities. High rates of obesity, heart disease, diabetes and stroke are societal, but have higher rates of incidence in many Tribal communities. These disparities may be rooted in complex historical and social dynamics. Additionally, many Native communities experience difficulty in accessing nutritious, culturally appropriate foods, either due to geography or cost (Bell-Sheeter, 2004). Across the country, Tribal leaders and Native organizations actively support food sovereignty and healthy food programs as well as other social programs intended to produce broader benefits linked to health and well-being. Fond du Lac is no exception.

Current Situation

Despite increasing awareness of the importance of food sovereignty and physical access to high quality foods, prevalence of obesity-related diseases, especially amongst young Native Americans continue to rise (Goetz, 2012). Poverty and geographic isolation limit food choices and the ability to "vote" for healthy options with one's pocketbook in many Tribal communities. In many Reservation communities, the primary source of food may be convenience stores or trading posts, with many of those selling non-perishable, high-fat and high-sugar snacks at the expense of fresh fruits or vegetables (Joe & Gachupin, 2012). At Fond du Lac, there are two convenience stores but there are also two large grocery stores within two miles of the Reservation's eastern boundary.

Rates of heart disease and diabetes vary widely among Native communities though, generally, rates for American Indians in the Great Lakes region are relatively high compared with other Native American communities (MDH 3, 2005). In Minnesota, Native Americans suffer five times the rate of diabetes-related death of their white peers and almost twice the rate of African Americans. They also suffer from more diabetes related complications as they are four times more likely than whites to have kidney failure, twice as likely to have coronary artery disease (CDC 3, 2011), and 2.5 times more likely to have a stroke (CDC 4, 2011). The impact of these diseases on community health cannot be overstated. The transition to healthy eating is difficult for all communities, but particularly so for those economically disadvantaged. Identifying barriers to healthy eating is essential for developing successful interventions to confront these issues.

Categorizing the challenges faced by individuals living in food insecure areas, Hilary Shaw (2006) identifies three types of barriers to accessing healthy food: Physical, Economic and Attitudinal (as cited in Pine & Bennett, 2011). Physical barriers refer to concrete things that impact people's access to a grocery store, such as distance from a store, or lack of convenient transit options. Economic barriers include the ability to afford groceries or transport expenses to access affordable groceries, while attitudinal barriers are associated with the varying tastes and preferences of individual consumers (Pine & Bennett, 2011). In this report we try to articulate particular factors that individuals perceive to be contributing to their own food security and food access.

Various studies have focused on the physical and economic barriers to healthy eating and living in Native American communities, and these barriers include the lack of access to-grocery stores, high cost of food, and poverty. Bauer, et al. (2012) found that 40 percent of families experienced food insecurity, and that the primary barriers to healthy eating included lack of availability of high quality, reasonably priced, healthy food for families. Ikeda, et al. (1993) found financial status to be a major barrier to healthy eating. Another study focused on the dietary practices of Lakota Indian adults found that the major barriers to fruit and vegetable intake were not only expense and availability, but also quality of the available products offered (Harnack, Story, and Rock, 1999). Skinner, Hanning, & Tsuji (2006) observed that food cost, lack of food variety, and lack of responsive food vendors were the primary barriers to healthy eating amongst First Nation youths in Northern Canada.

Tastes, preferences and perceptions also influence healthy eating and living. Fila and Smith (2006) found similar results in their study of 139 urban Native American youths from the Ojibwe and Lakota tribes. The authors found no correlation between *intention* to eat healthy and *eating behavior*. However, youth eating behavior was associated with *attitude* (how much youth favor healthy eating), their subjective norms (how important others such as parents perceive healthy eating and how willing is the youth to comply with their suggestions) and their self-efficacy (the youth's perception of his/her ability to eat healthy).

Numerous studies have examined the barriers to a healthy lifestyle in Native communities, drawing attention to the complex and interrelated processes through which food decisions and actions are made. The importance of local context underscores this study and the method employed.

Project Background

Prior programming

In 1995, the Fond du Lac Band collaborated with the University of Minnesota Extension to develop the *Gitigaan* program, which for nearly fifteen years has taught gardening skills, encouraged the use of native, local foods and promoted a traditional lifestyle to address health and other issues. The program continues today through eleven weekly classrooms sessions that begin in late March and end just before the gardening season. In recent years the program has been supported by a dedicated group of community members and the Tribal government.

In 2009, the Band's Resource Management Division, and the Tribal and Community College partnered again with the University of Minnesota Extension to develop and deliver the Thirteen Moons program, a Tribal Extension Program. Thirteen Moons uses the Ojibwe lunar calendar to frame monthly workshops and seasonal educational events that relate to traditional natural resource and cultural activities. Thirteen Moons was designed, in part, to complement to the Gitigaan program, with an emphasis on hands-on experiences when appropriate – in a way that sequential and weekly indoor offering could not accomplish. The Gitigaan and the Thirteen Moons programs were important foundational programs for this project. The true catalyst for the development of this project, however, was the recent experience of the relatively new Ojibwe Garden program.

The Ojibwe Garden

In early 2011, a group of stakeholders that included the FDL Tribal and Community College, the FDL Band, UMN Extension and the US Department of Agriculture's Natural Resources Conservation Service (NRCS) collaboratively developed a proposal that ultimately became the Ojibwe Garden program. One of the aspirational goals of the project was to bring into partnership several diverse efforts with overlapping themes. These included the Thirteen Moons and the Gitigaan programs as well as other efforts related to food, natural resources and well being. The Garden program's principal mechanisms were to be a shared, functional agro forestry demonstration and teaching space and a natural resource enterprise approach. The garden program began in earnest in the spring of 2012.

In early 2012, the program hired a full-time coordinator, who led the transformation of a disused hockey rink into a productive agricultural space, and later used production from that space to supply a number of local wholesalers and consumers. The program offered numerous weekly, monthly, and quarterly educational opportunities to community members as well as a running blog detailing production

activity and decision making processes. Additionally, the Fond du Lac Tribal and Community College hosted a natural resource enterprise workshop in early 2013, featuring entrepreneur 'Famous Dave' Anderson and other enterprise oriented presenters. The program met and exceeded many of its goals and expectations. The Compass program emerged not from the successes of the garden program, however, but from the perception that, despite its successes, it failed to capture community interest and participation in healthy food activities.

In general, educational offerings at the garden and related to food and natural resource enterprise development were poorly attended, even those that specifically targeted themes identified by community members as areas of interest through other venues. Pilot food distribution programs that used the garden's produce were not well utilized, though community members expressed a high level of interest. Poor participation rates and limited uptake of food production by community members triggered serious reflection by planners on appropriate next steps for the garden program and other possible program interventions that might target similar audiences or themes. Originally, it was believed that food availability and access were limited and that community members would readily adopt healthy foods if and when they were made available. Though access interventions of the garden program had some clear design and execution flaws, these food distribution pilots did not meet expectations and challenged that initial understanding of the issues. The program's stakeholders made the strategic decision to take a step back before taking another step forward, hoping to better understand the best direction in which to proceed. The *Gwayakosijigan* (Compass) Project emerged from these efforts.

Health and Nutrition Programming

In addition to the efforts described above, health driven initiatives have been undertaken by the *Min No Aya Win* (MNAW) Human Services Center, which includes a clinic and nutrition services for the FDL Reservation. Many nutrition services have been offered to community members with the goal of improving nutritional and health outcomes. Healthy cooking classes have been offered in the community for about ten years. Classes are hands-on and beyond cooking the recipe they focus on specific food preparation skills such as cutting peppers or trimming fat. Recipes chosen for the cooking classes are typically diabetes-friendly foods or traditional foods such as venison and wild rice. Cooking classes have also been designed to target specific groups.

Along with the cooking courses, sixteen-week pre-diabetes courses are offered and participants in this class are encouraged to join cooking classes upon completion, to continue learning about healthy eating. Pre-diabetes courses are also accompanied

by free exercise class offerings. For individuals with diabetes, the clinic, their dietician, and diabetes educators coordinate care and education.

With the onset of this project came the realization that natural resource and garden programs would better serve the community if integrated with ongoing heath programs offered by the FDL clinic. The Compass project was an effort to collaboratively develop and execute a study that would support integrated action.

Methods

Project Development

The Compass project was designed to move community actors and external stakeholders, such as Extension, closer to the overarching and longer-term goal of positively influencing FDL community wellness through increased adoption of healthy foods. The project's short-term goal was the generation of new and critical information that would enhance stakeholder understanding of the FDL community food system, particularly as it is experienced from the food consumers' perspective. In essence, the project was designed to accomplish two things:

1. *Map the food system from the consumers' perspective*
2. *Work with those consumers to develop a food decision/action framework.*

These short-term project objectives emerged directly from strategic discussions related to the successes and challenges faced by the Ojibwe Garden program, but that were challenges shared, no doubt, by other programs. A proposal based on the two objectives was developed and funded, with support from Fond du Lac and several areas within the University of Minnesota Extension. Once funding was secured, a core planning team was recruited. The role of the core planning team was to refine the project by making decisions about the best approaches for implementation.

Core Planning Team Recruitment

Health and wellness relate to many aspects of a person's life. From the outset, it was established that the core team would include representatives from several disciplines, or areas of interest. It was also deemed critical that the team included members from each of the two primary stakeholder groups: Fond du Lac and UMN Extension. Extension team members were recruited from natural resources (forestry), community vitality, and health and nutrition. Similarly, FDL team members were recruited from the Ojibwe Garden program, human services and planning. The intent was to capture diverse perspectives and to involve individuals

from the programs most likely to utilize the newly obtained information through adaptation of existing programs or development of new interventions and partnerships. Core team members committed to a series of meetings (3 - 5), during which the mapping and interview approaches were designed and an action plan was created.

Participant Recruitment

The planning team sought a diverse sample of the FDL Reservation population to provide a broad range of insights into the food system. Participants were recruited with the goal of representing three population segments:

- Healthy/active individuals, represented by referrals
- Financially challenged individuals, represented by those participating in the food distribution (commodities) program
- Aspiring healthy eaters, represented by those who applied for the Ojibwe Garden's 2012 Community Supported Agriculture (CSA) program.

Selection of the groups was guided by a desire to identify different community member experiences related to income, education and motivations. Likewise, the decision was made to stratify each of three groups by age, with participation targeted equally for each of three age groups: 18-30, 31-51 and 52 plus. Table 1 presents the ideal recruitment scenario for the project.

Table 1. Ideal distribution of project participants, by group and age (N=27)

	Group 1	Group 2	Group 3
18-30	1A1 1A2 1A3	2A1 2A2 2A3	3A1 3A2 3A3
31-51	1B1 1B2 1B3	2B1 2B2 2B3	3B1 3B2 3B3
52+	1C1 1C2 1C3	2C1 2C2 2C3	3C1 3C2 3C3

Actual recruitment efforts targeted four participants for each age range in each group to account for the possibility that some participants might not be able to make the scheduled events. Thus, while the ideal number of participants was 27, the potential existed for recruitment of 36 community members. Fond du Lac team members oversaw recruitment of community members. Participation was voluntary

and all mapping (phase I) and interview (phase II) participants were provided with a $50 gift card at a local grocery in appreciation for their shared time and insights.

Phase I: Mapping

Development of the Mapping Protocol

After recruitment, a second important set of decisions focused on the mapping protocol, or how to get the community members to create personal and customized maps that contained adequate and useful information about their personal food systems. The core planning team reviewed participatory mapping best practices and discussed the specific types of information desired. Both the best practices and desired information were then weighed against some of the practical constraints of the project: limited time, limited familiarity with the food system concept, and a need (to some extent) to standardize results.

Ultimately, the team settled on a stepwise process that first introduced community members to the project and then asked them to follow a specific mapping protocol, which transformed a blank page into a highly personalized food map that retained critical elements for comparison (Appendix A). Maps could take any form and include any content, but the protocol required participants to identify:

- *The top three and most important source of food in terms of spending*
- *The top three and most important source of food in terms of quantity of food*
- *The top three and most important source of food in terms of frequency of visits*
- *The top three and most important source of food in terms of social or cultural value and*
- *The overall most important source of food for whatever reason.*
- *Up to three primary travel routes*

Maps were coded to protect the privacy of the community members and to allow for identification of individual's maps with the recruitment groups and age strata. An early version of the mapping protocol was tested on the core planning team and then refined before use with community participants.

Mapping Sessions

Five food-mapping sessions were held on four different days. Sessions were held at multiple times on multiple days of the week to accommodate as many schedules as possible and they lasted between 1 and 2 hours. At least two core team members were present to conduct each of these sessions.

Recruitment proved a challenge, particularly from the food distribution group (Group 2; Table 2). There was speculation that the food distribution program disproportionately serves the 31-51 age strata, as younger and older ages may be

served by other programs or may not be part of the social services system. This is something that could be investigated further. Moreover, we were unable to recruit any homebound participants, whose insights on the food system may vary considerably from other community members.

Table 2. Actual distribution of project participants, by group and age, for the mapping activity (N=24)

	Group 1	Group 2	Group 3
18-30	1A1 1A2 1A3		3A1 3A2 3A3
31-51	1B1 1B2 1B3	2B1 2B2 2B3 2B4	3B1 3B2 3B3
52+	1C1 1C2 1C3		3C1 3C2 3C3 3C4 3C5

Mapping sessions began with the reading of an introductory statement (Appendix A) and an opportunity for participants to ask questions about the project. Community members were then given large sheets of paper (approximately 24”x36”) and an assortment of drawing media (e.g., markers, colored pencils, and crayons), then asked to create a map that identified their home and other features related to their food activities. If participants had locations they did not want to share, such as a secret berry patch, they were encouraged to include the source of food without its specific location on the map. Participants were asked to create a key to the map and list their primary mode of transportation within this key.

After completing the initial map drawing, participants were asked to place stickers denoting their three most important food sources based on money spent, quantity of food acquired, frequency of visits per week, social/cultural importance, and overall importance. Each of these categories were marked with color specific stickers and then ranked by stars to identify the top food source for each category. After completing this process, participants were encouraged to indicate with white stickers any other places that were used as food sources, but were not in the top three for any category, and were asked to add any food sources they had not considered initially that came to mind during the process. The map-making process was very loosely scripted to leave much of it open to participant interpretation. Sections of a few maps are included in the Results section.

Phase II: Sondeo

The Sondeo method is a participatory rapid assessment of community-defined priorities that requires participation from a diverse set of individuals as part of an assessment team. It has been used successfully at Fond du Lac and led the development of the Thirteen Moons program (Wilsey & Beaulieu, 2010). Typically, in the Sondeo process, researchers travel to a community and interview community members for three days regarding a topic of interest (Figure 1). At the end of each day, the researchers will gather to discuss their findings from the day and define priorities for further inquiry in future days of conversation. After the third day of interviews, researchers gather to write an informal report summarizing their findings. The Sondeo for this project was not as immersive as is typical, which permitted more involvement from Fond du Lac community members who had other professional responsibilities. Interviews were only conducted with people who had drawn food system maps instead of approaching the members of the general public spontaneously. The conversations focused on the participant's maps, how they made food decisions, barriers they faced in making desired food decisions, and factors that increase their ability to make desired food decisions.

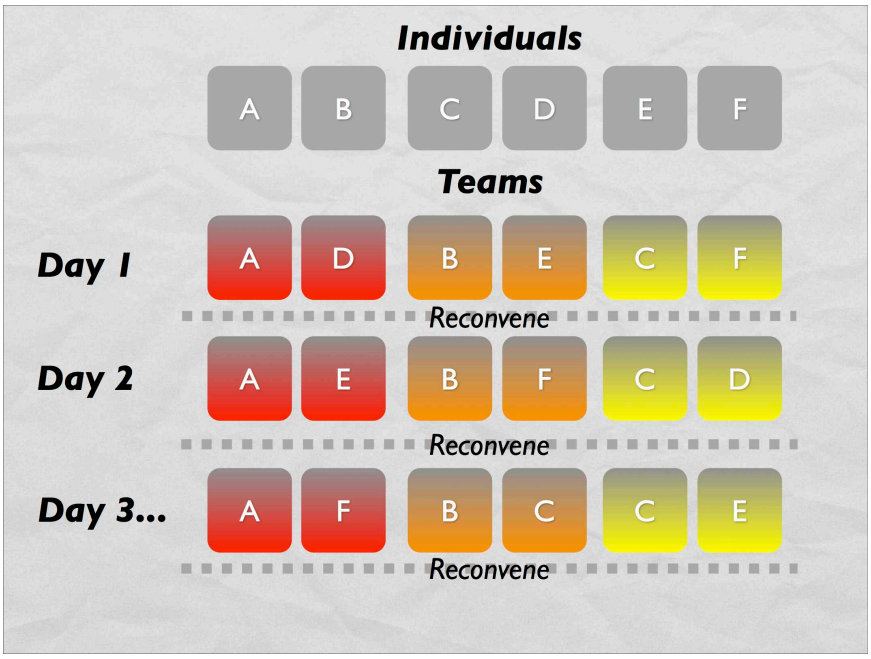


Figure 1. Schematic diagram of the Sondeo process

Contextualization of the Community Capitals and Development of the Rubric

The Sustainable Livelihoods Approach (SLA) is way of thinking about objectives and priorities that places people and the community capitals at the center of all development activities to ultimately improve the effectiveness of development initiatives (DFID, 2001). The Department for International Development (DFID) adapted the SLA to a framework for identifying the factors and linkages impacting five community capitals that influence livelihood adaptability and sustainability (Krantz, 2001).

The core team contextualized DFID's definitions of the community capitals to more specifically address their role in individual's desired food decisions. Given that the main focus is on food decisions and actions and their impact on healthy eating, a definition for a healthy diet is provided: A diet that meets caloric, vitamin, and mineral requirements, allows the person to maintain a healthy weight, and reduces the risk of disease ("Livelihoods Assets," 2009). Table 3 presents the modified capitals definitions. Appendix C presents a more thorough description of the transition from the SLA to our modified food system asset descriptions.

Table 3. Contextualized and simplified capitals definitions

Capital	Definition
Natural Capital	The natural resource stocks from which food can be obtained, including atmosphere, trees, land and bodies of water.
Physical capital	The basic equipment and goods needed to obtain, process, and prepare healthy food.
Social Capital	The social resources upon which people draw to obtain and prepare healthy food, including friend and family support and community networks.
Human Capital	Represents the skills, knowledge and abilities necessary to obtain and prepare foods necessary for a healthful diet
Financial Capital	The financial (cash or barter) resources available to obtain food.

Adapted from DFID (2001)

Creating a Food System Rubric Based on the Sustainable Livelihoods Framework

Placing the five capitals within a framework directly relevant to food systems was the next step in developing a rubric with which all eight members of the Sondeo team could process participant's statements. Beginning with the modified definitions, the core developed a rubric that would be used to assess how participants *perceived* their ability to make desired food decisions with respect to each individual capital. For each capital, the participant's expressed perception was assessed to be Blocked, Impeded, Neutral, Enabled and Enhanced.

As a general rule, participants who were rated neutral perceived themselves as able to make decisions according to their preferences, typically not having made specific reference to the particular form of capital as something that made food decisions easier or more difficult. To be classified as blocked, a participant would make statements in the interview that suggested that they perceive a lack of access to a particular of capital renders them unable to make their desired food decisions. To be classified as impeded, a participant would make statements that suggested that they perceive lack of access to this type of capital somewhat limiting their ability to make desired food decisions. To be classified as enabled, the participant would make statements that suggested that they perceive the type of capital as making it easier for them to make desired food decisions. Finally, to be classified as enhanced, the participant would make statements that suggested they perceive access to this type of capital as an important factor in making desired food decisions. Appendix B presents a more complete overview of the evaluation criteria. The rubric provided a consistent tool for specific and general discussions relating to the factors that participants perceived to be directing their food decisions and actions.

Participant interviews

Participants were contacted via telephone or e-mail, based on the contact information they provided during mapping sessions. Willing participants were scheduled for an interview over a three-day period. Nineteen of the initial 24 mapping participants were scheduled in this timeframe (Table 3). One was subsequently rescheduled to a time outside of the three-day window due to a conflict for the participant. Ultimately, 19 of a desired 24 interviews were completed.

The core team gathered for a two hour briefing session before initiating the interview process on the first day and reconvened for group discussions at the end of the first and third days to discuss common themes, areas of focus, and to develop preliminary analysis. Consistent with the Sondeo method, the interview process followed a casual, non-scripted format. Each participant met with (typically) three core team members and talked about his/her map, reflecting upon the places drawn and elaborating upon what locations and areas the stickers signified and why. Core team members probed with neutral questions, when needed, to provide opportunities for participants to comment on each of the community capitals, but without using that specific terminology. Most conversations lasted approximately one hour. Notes were not taken so that team members could direct full attention to the participants.

Table 4. Actual distribution of project participants, by group and age, for the Sondeo (N=19).

	Group 1	Group 2	Group 3
18-30	1A1 1A2		3A1 3A2
31-51	1B1 1B2	2B1 2B2 2B3	3B1 3B2
52+	1C1 1C2 1C3		3C1 3C2 3C3 3C4 3C5

Processing the conversations

Interview scheduling allowed time for individual and team processing immediately following the conversations. During this time, each core team member first individually filled out the Sondeo evaluation sheet (rubric; Appendix D). This sheet prompted the team member to undertake the following process.

1. Record everything remembered from the conversation and insights.
2. Using several prompts, identify factors that the participant highlighted as enabling and/or impeding desired food decisions and identified the role that time played in making desired food decisions and actions.
3. Using the capitals framework, identify specific mentions of different types of assets / deficiencies from the discussion.
4. Assess the participant's capitals profile using the scale.

After individual team members completed the form, the interview team reconvened to develop a consensus score based on shared impressions and discussions between individual team members. Thus, each participant was assessed by each team member and then again by the collective interview team. All notes and assessments were retained as part of the participant profile.

Upon completion of the interview process, the larger core project team met to discuss the overall experience and any revelations based on interviews, to identify important themes, to reflect upon the successes and shortcomings of the project, and to propose and formulate recommendations for future program interventions.

Phase III: Analysis

The Sondeo concluded with a formal analysis of interview data by the larger group. Due to time limitations, substantial additional analysis of interview data continued among three of the core team members for several weeks, enhanced by periodic check-ins with the larger team. Capital profiles, maps and interview responses were examined for patterns. Maps were re-evaluated, looking at the frequency of responses, position of food sources with respect to participants' main routes, and food sources rated most important by participants. Prior to the writing of this report, an outline of proposed themes and results was presented to the full team to generate additional insights, input, and critical discussion.

Results

Food System Map Data

We designed the food system mapping protocol to elicit participants' most important food sources in terms of money spent, quantity of food obtained, frequency of visits and social or cultural reasons, as well as their most important overall food source. Twenty-four members of the Fond du Lac Band participated in the mapping sessions. General, aggregated results include:

90 - Number* of places designated as food-related
67 - Number* of places designated as important food sources
24 - Number* of places designated as important for amount spent
24 - Number* of places designated as important for food quantity obtained
25 - Number* of places designated as important for frequency of visits
39 - Number* of places designated as important for socio-cultural value
12 - Number* of places designated as important for most important food source, overall.

** Number is approximate due to occurrences of similar though differently worded responses (e.g. Pizza, Southgate Pizza, Pizza Hut).*

Image 1a. Sample sections from community members' personal food system maps.

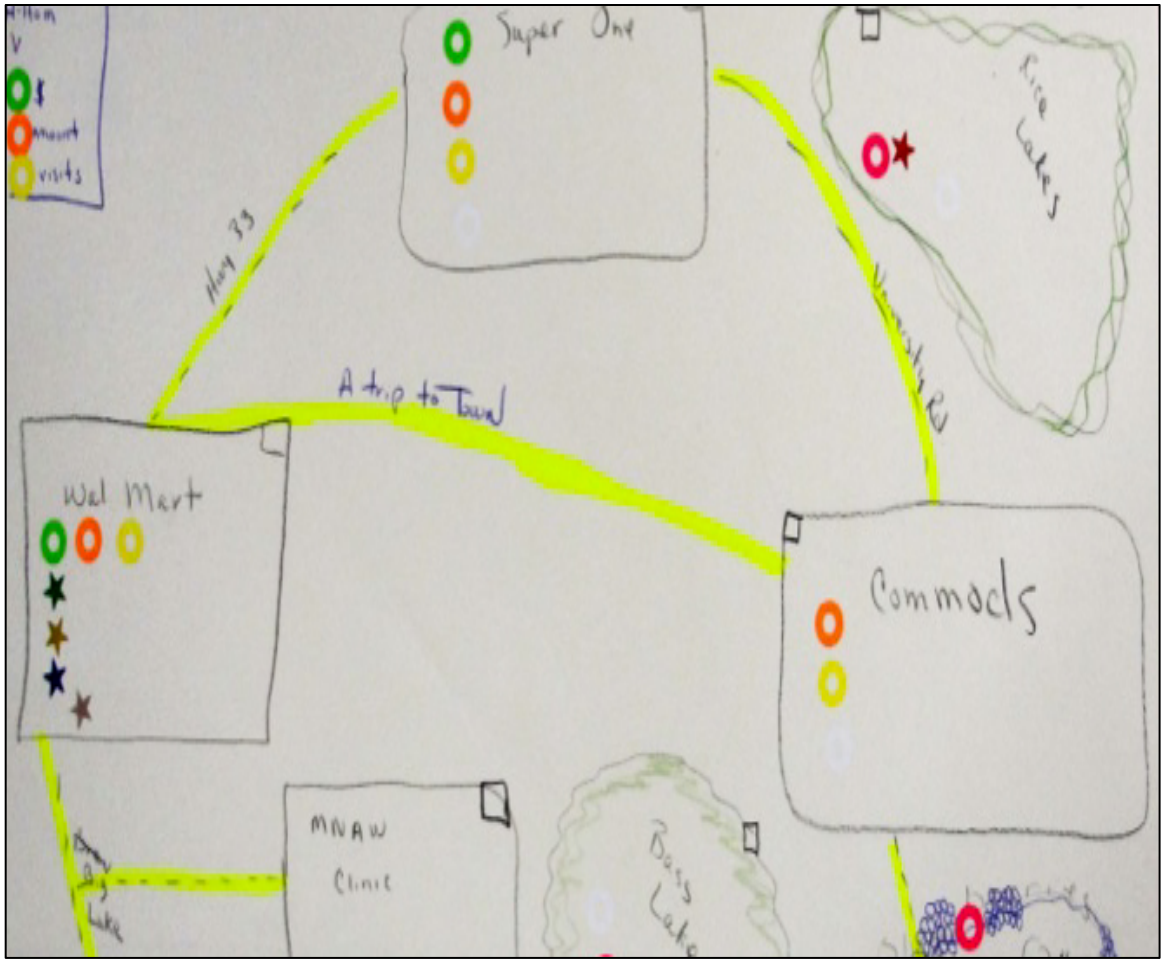


Image 1b. Map section

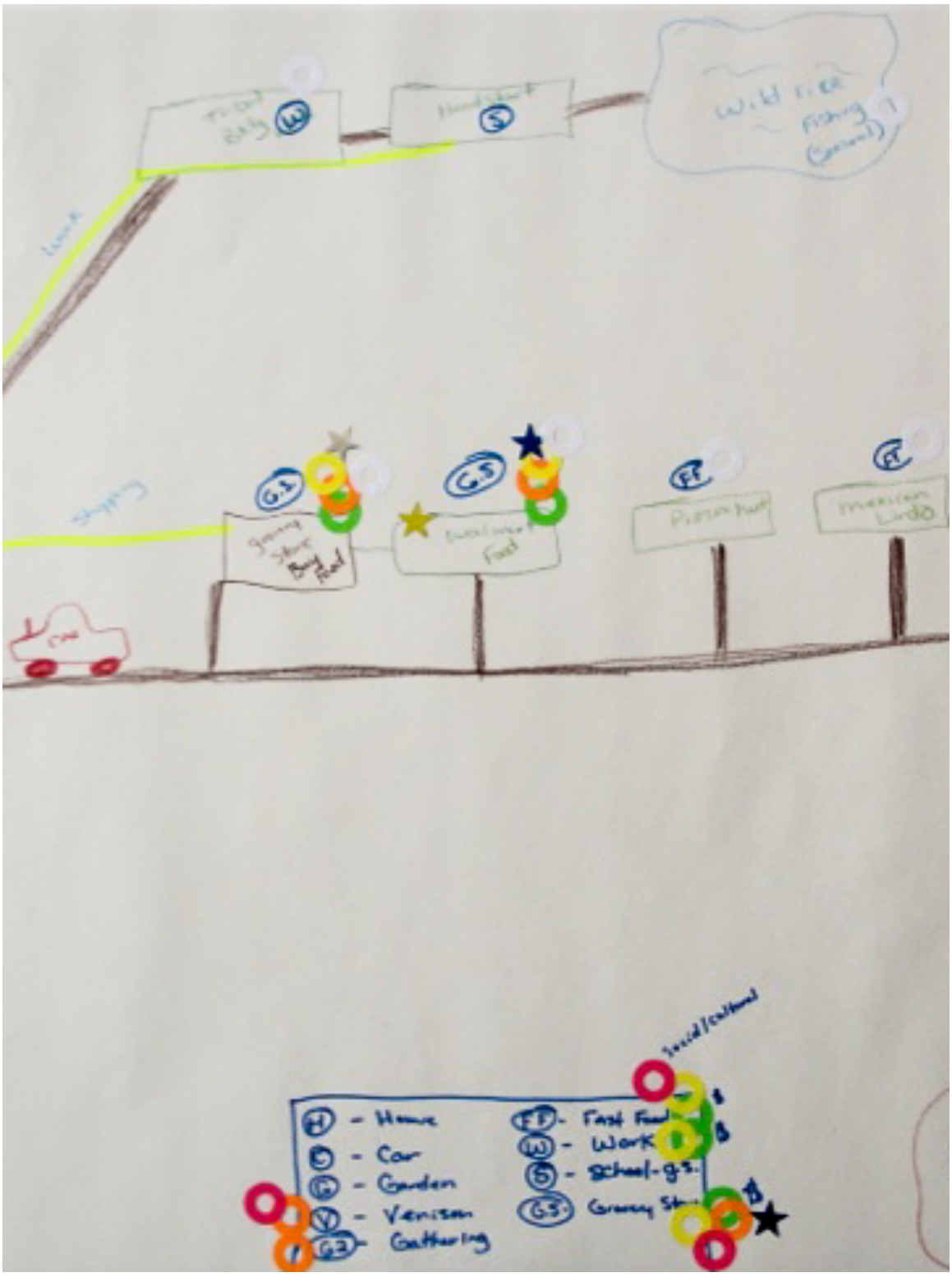
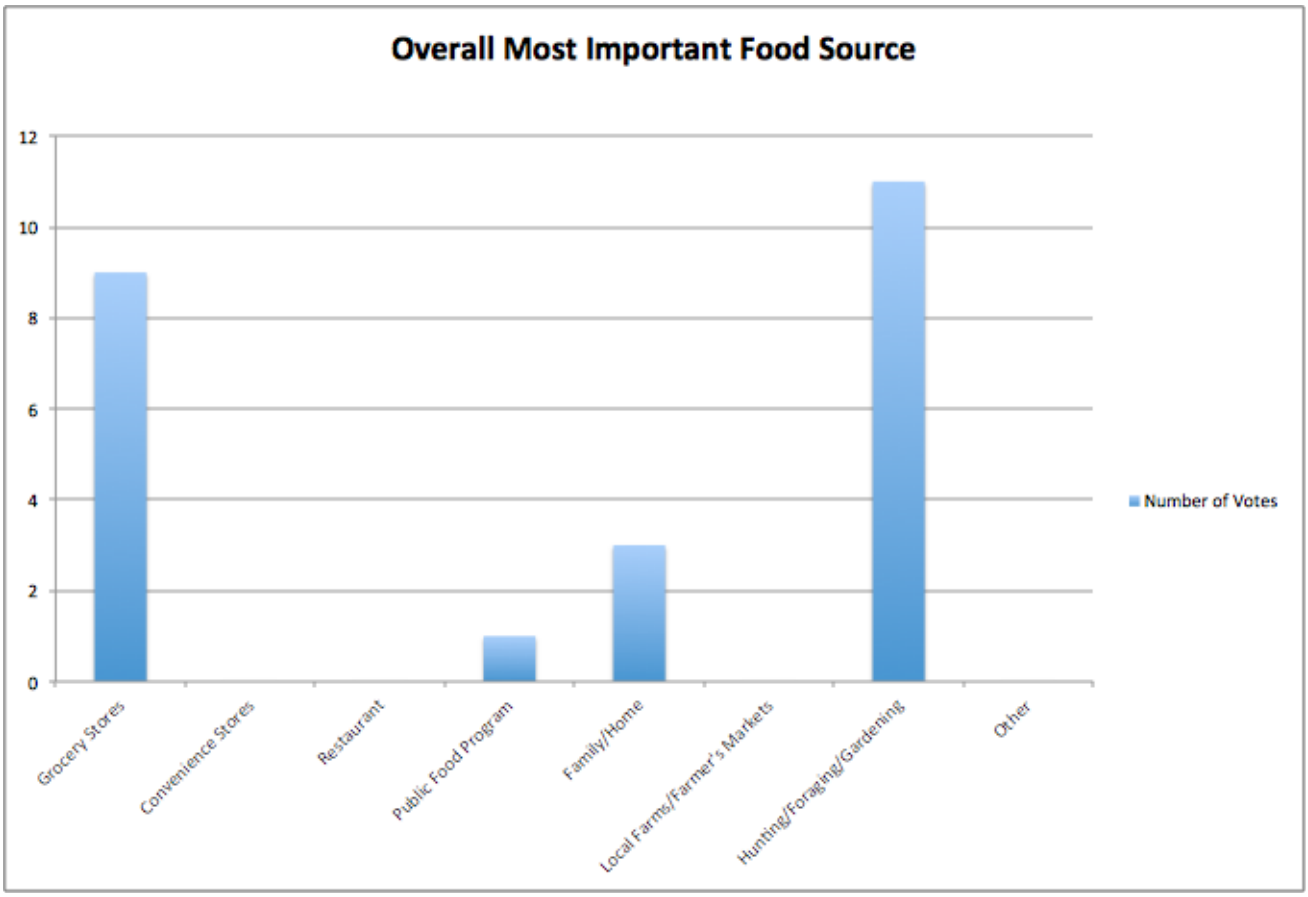


Image 1c. Segment of a participant map

Most important food sources

Figure 1 summarizes participants' responses to the question of overall most important food source, by category. Categories emerged from natural clusters of responses (such as foraging / gardening) and from general sources typically referred to in the literature (such as convenience stores). In some cases, categories were included for comparison even though no response actually fell within the category. For the group involved in this project, "hunting, foraging, and gardening" responses were the most frequently named, followed by "grocery stores" and the "family or home". Most important food sources included Wal-Mart, Super One, parents' house, home, wild-rice, ditch banks, commodity foods, family hunting shacks and fishing lakes.

Figure 1. Overall most important food sources, by category.

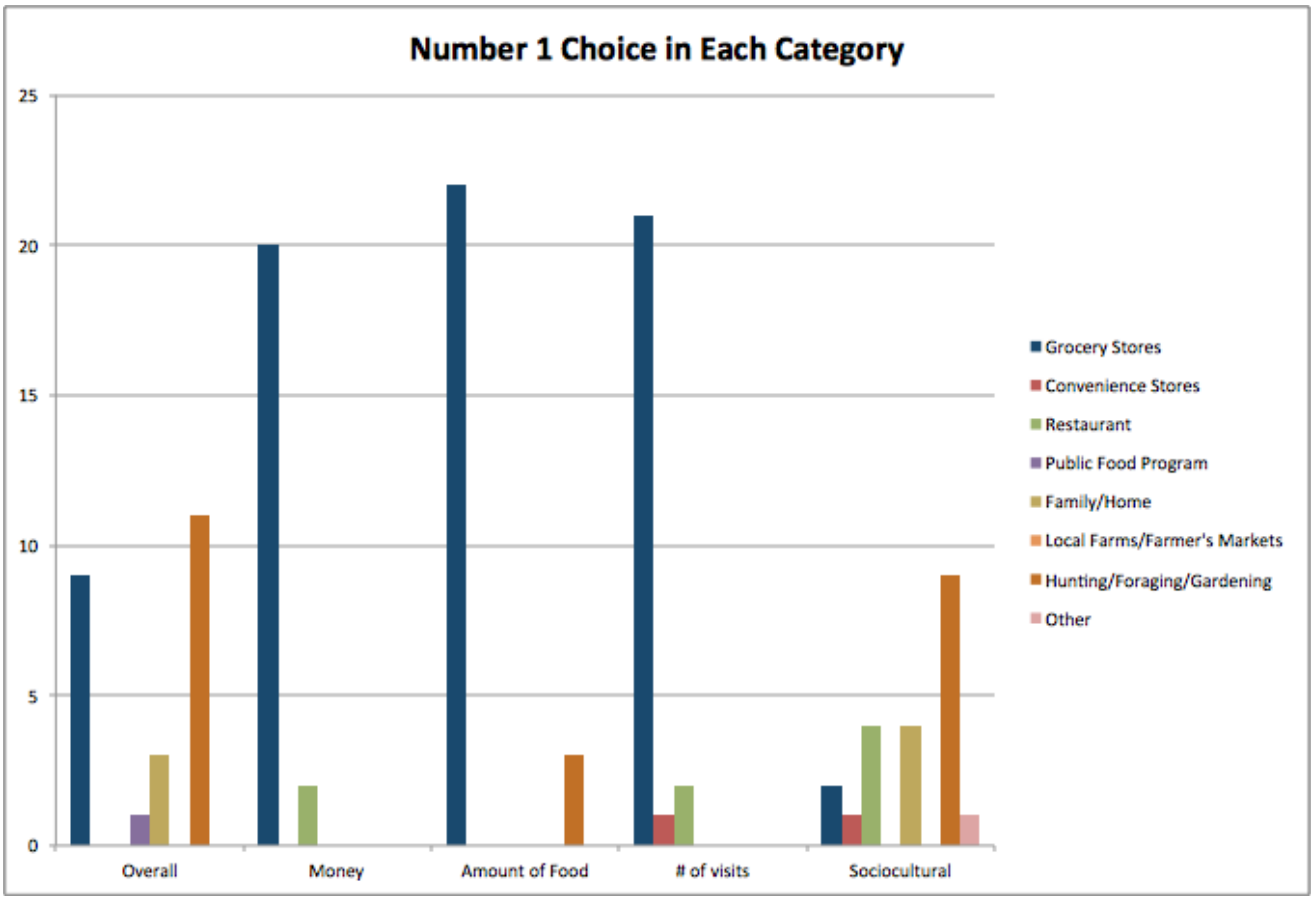


Eleven individuals (46 percent) identified a 'natural' food source as their overall most important, when responses such as wild edibles, wild rice, lakes and family hunting shacks are included in that category. The home garden was the most frequently cited overall most important food source, identified by five individuals (21 percent). Many of these sources identified as most important were natural foods

or places to get natural foods -- Appendix E details other examples of natural food sources mentioned by participants.

Twenty of the twenty-four participants (83 percent) spent the **most money** at Super One or Wal-Mart. Likewise, twenty-one out of twenty-four participants (88 percent) also got the **most food (quantity)** and had the **most visits** at Super One or Wal-Mart. Traditional sources of food such as hunting, foraging, fishing, or gardening were also the **most important socio-cultural sources** of food for nine people, followed by restaurants for five, whereas Super One and Wal-Mart only accounted for two.

Figure 2. Most important food source, by category, for each focus area



Food System Maps: Interpretation

Some surprising patterns emerged from the maps. First, participants placed little emphasis on the importance of convenience stores, which are a food source typically associated with Tribal food systems. Only one person in the group selected a convenience store as their most visited shop. None selected a convenience store the overall most important, site of most money spent, or site where most food was obtained. Only 25 percent of participants ranked convenience stores in any category. This finding is inconsistent with the common portrayal of Reservations as food deserts. To the contrary, most participants obtained a majority of their food from sources with a full complement of food services (i.e., produce section, deli counter, etc.), suggesting that participants have at least the most basic access to foods that are as healthy as those available to anyone else in the community.

Participants emphasized the importance of natural foods sources and mentioned diverse sources and types of natural foods including moose, venison, fish, berries, wild rice, maple syrup, vegetables, herbs, and teas. On the other hand, some

participants had a lack of diversity in all food sources and included only three to five total food sources on their maps.

After making their maps, participants were asked to reflect on their maps and anything they learned from the process. Some expressed interest and excitement about the prospect of thinking about their food system in a new way. Some also noted surprise at how few food sources they actually utilized, while others were shocked to recognize how much money they spent at restaurants.

Collectively and for many individuals, the maps portrayed a food system that covered a wide geographic area, with participants going to Duluth or Superior to restaurants and grocery stores, but also including natural food sources from other Reservations such as Bad River, Grand Portage, and White Earth. The limitations faced by particular individuals notwithstanding, the collective reporting of over ninety different food sources in this relatively small community suggests that participants have a wide variety of possible options for making desired food choices and, at least some individuals are able to travel to access them.

Participants also documented the primary routes they travel on their maps. Not surprisingly food sources tend to be on principal travel routes. Only one participant had a frequent food source off their main route. The other twenty-three participant's most frequent food sources were either on their main routes or the trip to the food source was a main route in itself. Fifteen of the twenty-four people (63 percent) had at least one route that was expressly for the purpose of acquiring food.

Fourteen of twenty-four participants (58 percent) mentioned at least one natural source of food. Eleven of the twenty-four (46 percent) considered a natural source of food their overall most important source of food. Twenty-four different types or sources of natural foods were mentioned on maps. Two of twenty-four people (8 percent) obtained the largest amount of food from natural sources, while five others (21 percent) stated that natural sources of food were in the top three food sources regarding amount of food obtained.

Sondeo data

The interviews with individual participants that followed the map activity generated deeper insights into personal food system maps; into participant's perceived ability to make desired food decisions; and into the ability to take desired food related actions. A large number and variety of factors that inhibit and enable perceived ability to make desired food decisions and to take food related actions were

identified. Table 5 summarizes these factors, divided into the five capitals: financial, physical, human, social and natural.

Nineteen of the original twenty-four participants discussed many assets and the obstacles they have in making their desired food decisions, but overall assets featured more prominently in the conversations.

Table 5. Specific factors mentioned as inhibitors or enablers to food decisions and actions (Italicized items were specifically emphasized by participants).

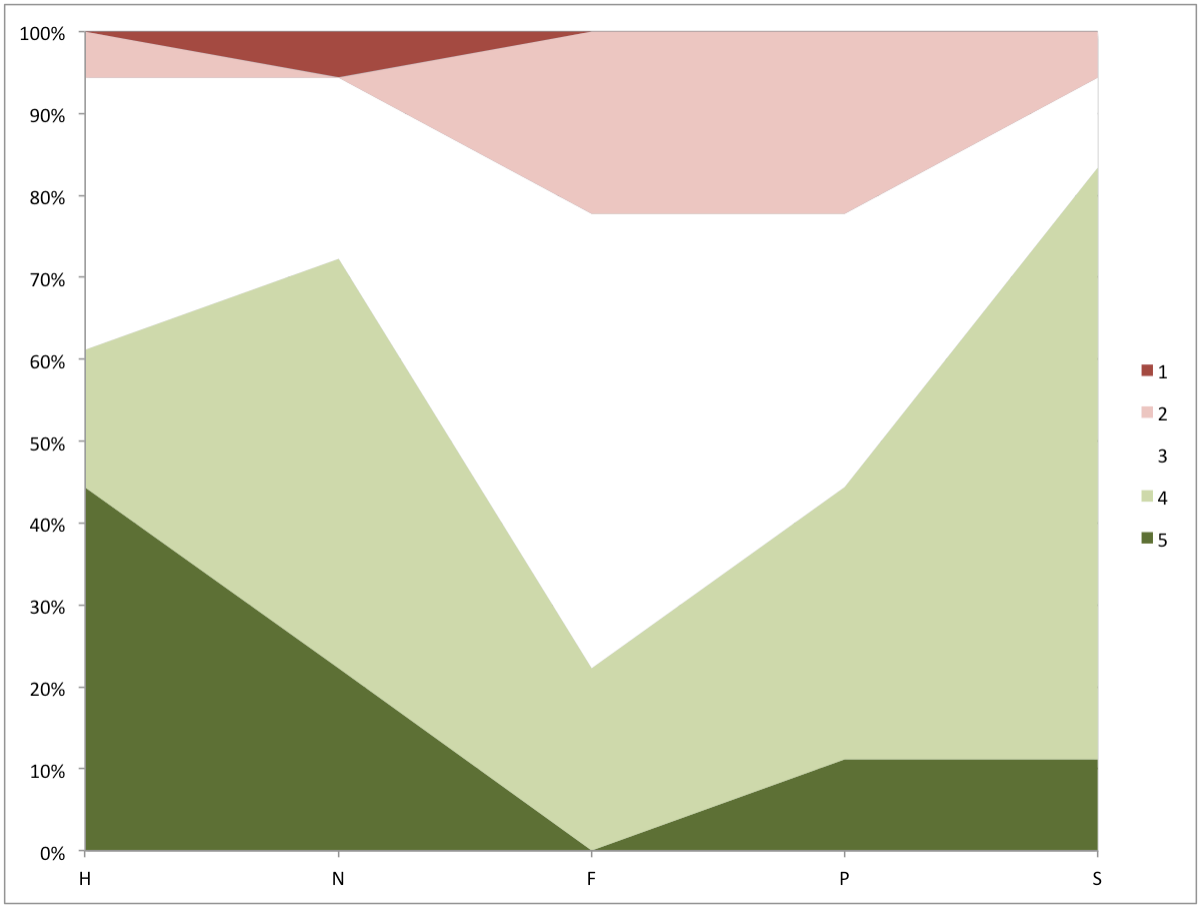
Inhibiting Factors	Capital	Enabling Factors
• *Low Income* • Money spent on restaurants	**Financial** The financial (cash or barter) resources available to obtain food.	• Fiance started a new job • Commods • Job • Informal jobs • EBT • Living with daughter • Coupons • Spouse's job • Barter with family and friends • Use of fast food/Wal-Mart
• *Lack of a car* • Lack of a freezer • Lack of a grill • Bad roads	**Physical** The basic equipment and goods needed to obtain, process, and prepare healthy food.	• Kitchen • Freezer • Vehicle • House • Canning equipment • Car • Bullet Blender • Kitchen gadgets
• Knowledge of canning • Lack of gardening knowledge • Time management • Planning • "Don't know how to cook" • Don't know what to do with a garden	**Human** Represents the skills, knowledge and abilities necessary to obtain and prepare foods necessary for a healthful diet.	• Cooking knowledge • Shopping smart • Foraging knowledge • Budgeting • Gardening • Job skills • Motivated • Strategic • Gardening • Life skills for living as a single person • Composting knowledge • Planning skills • Nutrition knowledge • Navigating FDL transit • Online resources • Harvesting deer • Clean fish • Seasonal knowledge • Knowledge of how much food needed for the year • Knowledge of where to forage/hunt • Knowledge of traditional pReservation practices • Knowledge of teas

• Displaced from one district to another • Multiple deaths in the family • Children live far away • Less family time than when mom & grandma were at home • Only connection in community are father and mother • Family more disconnected since mother died • Recently moved back to the area	**Social** The social resources upon which people draw to obtain and prepare healthy food, including friend and family support and community networks.	• Friends who give rides • Friends who share venison, fish, rice • Friends and family nearby • Network of people she gives rides to • Goodwill (feeding neighbors) • Friends help in return when she needs it • Support of the elders • Does prayers for others • Sharing garden produce with others • Mother cans • Garden group • Master Gardener • Large, supportive family • Gitigaan • Family gatherings • Pow-Wow trails • CSA membership • Running group • Friends and family at Grand Portage • Friends and family at another Reservation
• New homes built behind house	**Natural** The social resources upon which people draw to obtain and prepare healthy food, including friend and family support and community networks.	• Access to berries • Access to wild rice • Access to venison • Hunting and fishing access • Garden • Berries • Lake • Land owner (enough to farm) • Natural sources of food through social connections • Access to land to forage

The rubric

Each participant was assigned a score – from 1 to 5 – for each of the five capitals based on the frequency of mentioning factors that helped or hindered their ability to make food decisions. A score of three represented "neutral;" a neutral score indicated that an individual emphasize neither a perception of being enabled or impeded by the types of assets in question. A score of 1 indicated that participants felt that their asset status in the particular area totally blocked them from being able to act in the desired way while a score of 5 indicated that their asset status not only enabled but enhanced their food decision and action capabilities. Figure 3 shows the distribution of these scores, by percentage of responses, among the five asset types (H=Human, N=Natural, F=Financial, P=Physical, S=Social). For example, just over 40 percent of the participants spoke of their human capital (assets) in a way that indicated that their decisions and actions were enhanced (a score of 1). The white band in the middle of the figure is the zone of neutral responses. The pink zone indicates that financial and physical assets (or lack thereof) were the predominant barriers for the group. Conversely, the two green zones reflect that human, natural and social assets enable or enhance food related decisions and actions.

Figure 3. Summary of capital scores



Sondeo: Themes

Analysis of participant comments and stories suggested three major themes within the various factors guiding food decisions and actions. Note that these themes are not presented as the determinant factors in food decisions actions, only as major themes prevalent in participant comments and stories. Likewise, five minor themes emerged that focus on patterns or other interesting findings.

Major themes

- Many participants perceived financial and physical factors as the principal impediments to personal food decisions and actions.

- Many participants utilized combinations of human, natural and/or social assets to enable and enhance personal food decisions and actions, often taking advantage of these assets to overcome acknowledged financial and physical capital deficits.

- Major life stressors (e.g. death, addiction) substantially influenced perceived ability to make desired food decisions and actions.

Minor

- Transitions. Several young mothers had undergone dramatic personal transitions/transformations. Their children served as important motivators in the process. They are committed to healthy, active lifestyles for themselves and try to encourage others to engage in healthier behaviors as well.

- Cultural boundaries. Some participants who engaged in healthy behaviors noted that other community members sometimes accuse them of acting "white" or non-Native. They did not necessarily indicate that questioning cultural authenticity was a barrier to making healthy decisions, but we speculate that it might be an implicit barrier for them or others interested in engaging in healthy eating and exercise.

- A subset of participants returned to the community in after many years away, often returning to care for family members or following the loss of a spouse. Some of these participants expressed feelings of loneliness or being disconnected from the community.

- Planning was a recurring theme in their success for those who prioritized a healthy diet.

- The mapmaking process called attention to personal habits of some participants that they had been unaware of prior to participating.

Major themes

Financial and physical limitations. The perception that financial and physical factors impeded personal food decisions and actions was a major theme. Still, only five participants noted that finances significantly restricted their food choices. The vast majority of participants stated that they would not change their eating habits if their financial status changed or that it would be to add in more organic produce rather than the regular produce they already eat.

Also, while (lack of) food preparation and storage equipment was not generally noted to be a significant factor in food decisions, access to a functional kitchen, a car, house, canning equipment, and other kitchen gadgets were noted to improve flexibility in food decision-making. In only one case the lack of a personal vehicle represented a significant barrier to food acquisition because it required dependence upon others to get food. Other equipment deficiencies that participants perceived as limiting their food choices were (lack of) a freezer and a grill.

Based on the literature, we anticipated that challenges in accessing stores or other locations with healthy food would significantly limit preferred food choices. However, only one participant specifically mentioned access as a barrier to decision-making. This person did not have a personal vehicle and was therefore dependent on others for rides to the grocery store. Another participant shared that when she did not have access to a car or when the car is not working, she was able to rely upon Fond du Lac transit to conveniently get her to and from the grocery store.

Strategy. For the eight participants who specifically noted that physical or financial capital limited their food decisions, half addressed specific strategies and adaptations that allowed them to continue making desired food choices. Several of those who did not discuss specific strategies noted relatively minor limitations due to the absence of items such as a grill or garden. Typically, these adaptations occurred through leveraging human, social, or natural capital. Participants discussed using human capital through strategic shopping and using coupons. More often, participants used social partnerships to compensate for financial and physical capital shortcomings. Some participants used social connections to obtain access to natural sources of food such as moose meat, venison, fish, wild rice or berries that they were unable to obtain for themselves. One participant noted that as an elder she had access to game meat through the Resource Management Division and through gifts from friends and community members. Often, gathering berries, ricing, or fishing was framed as a family event, as was associated food processing activity. This perspective allowed participants to enjoy quality time with family

members while gaining access to preferred foods. Natural capital was accessed in this way and in gardens to supplement food supplies.

Participants reported use of financial resources to enhance food decisions when at least one adult in the household had a job. Some augmented financial resources through commodity foods, EBT, or barter. Though many of our participants seemed to have adequate income to make desired food decisions, some who did not stated that lack of financial resources affected the quality of food they were able to buy.

Adaptations to financial constraints

Five participants noted that financial constraints limited their food choices. Four of these five participants discussed specific strategies they used to overcome these financial constraints in making their desired food related decisions.

Strategic shopping is an important way to compensate for a lack of financial capital. One participant focused her purchases on sale items to make the most of her dollar and additionally incorporated food from discount stores such as Family Dollar. Another individual chose to buy items from specific sources that she knew had the lowest prices listed. Another participant described several couponing strategies to maximize her financial resources.

Utilizing natural capital also allowed participants to increase their food supply without spending additional money. One participant included gardening, ricing, and gathering berries as means of increasing her food supply, and also assisted in processing deer to gain access to venison.

Several participants also utilized social capital to make the most of their dollar. They pooled resources with family members. One participant described that money was tight and her EBT was insufficient, but because she was living with her daughter, both of them were able to pool resources to maximize the amount of food and nutrition value. Another described sharing food with her son, who was eligible for commodity foods. Lastly, one participant also described supplementing her income by performing odd jobs for elders.

Maximizing natural capital

Though almost all participants felt they had adequate access to nature, and that this access was important in building strong family ties and traditions, some participants through traditional or nontraditional methods were using the natural resources they accessed to improve their health, improve the environment, and maintain cultural values.

One participant grew up learning foraging, preserving, hunting, and fishing. She continued most of these activities and techniques throughout life and tries to share them with interested community members. Her routines were intimately connected with the seasons and she had the experience to know when to gather and procure foods in a sustainable manner and exactly how much to take to meet her needs. Her interactions with the commercial food system were minimal, as she bought salt and pepper from the grocery store, but otherwise obtained the rest of her food through foraging and gifts, as she's a respected elder in the community.

Another individual integrated traditional foods with other sources of healthy foods, gathering berries, and rice and occasionally fished, while close family friends processed rice and maple syrup. Her family also had a membership to a CSA and out of season she incorporated produce from the grocery store into their diet, incorporating pre-colonial foods, with non-traditional food sources such as sushi and CSA vegetables.

One participant was very engaged in composting, which allowed her to improve the quality of soil she was working with in her garden. She gathered composting materials from her current workplace, a former workplace, and home, and used the soil to maintain two gardens with a wide variety of vegetables.

One participant, who lived in a more urban setting, where land is scarce, has been innovative in developing home gardens. She used old bookshelves and tires to make containers to allow her to create additional natural capital and have bountiful gardens in an area with limited space.

Stressors. Participants struggling with grief, loss, or stress in their lives noted that their struggles often impacted what, when, and how they ate. One participant who faced significant losses over the last several months noted that many days she did not have the energy to do anything or eat proper meals, therefore cooking or grocery shopping were unlikely to take place. Another felt that the loss of her mother led to disconnections in her family network. In a desire to build social connections, she would often dine out. Loss of her husband had caused a third participant to withdraw from outdoor activities that she enjoyed. Instead, she took comfort in convenient foods and her routines of eating. A participant, who was working full time, going to school full time, and raising young children, felt that often food decisions had to be made in "survival mode". She tried her best to eat and prepare healthy foods for her family, but on occasion preparing nutritious meals

was not possible, so her family had to eat with family members who prepared less healthy food.

External threats and vulnerabilities

Factors beyond the food system also played a role in the ability of individuals to choose healthy foods and adapt to challenges in accessing the food system. Most notable in our discussions with participants were grief and loss. Some participants who struggled with the loss of spouses and family members expressed that the food system provided important companionship or comfort. One participant noted that since the loss of her mother, the family connections have not been as strong and she has sought social connections through dining out. Another woman stated that after the death of her husband, she returned to the area and since then, she had felt isolated. In particular, she had felt very limited in her interactions with nature for a variety of reasons. She expressed a lack of concern about what she was eating, felt a lack of control over meals that her mother prepared for the family, but felt that maintaining her particular set of eating habits was an important part of her routine and comfort with daily life. Lastly, a participant described how the deaths of many family members have caused her to have to function in survival mode. Because of her grief, she found it difficult to do anything, including buying and preparing food, so she tended to eat whatever was easy and available.

Minor themes

Transitions. Several of our participants had undertaken major transformations in their food and exercise habits, resulting in significant weight loss. These participants expressed a desire to be healthier for their children and by encouraging their children to be healthier, simultaneously helped them maintain these new habits as well. Not only did they want to be healthy to keep up with their kids and protect them from the potential of seeing their parents being ill, but they were also motivated by modeling healthy behaviors and creating healthy habits for their children at a young age. Their new diet and exercise routines were quite different from the diets they had while growing up. Some of these participants endorsed a goal of making these healthy choices the norm in their community.

Cultural boundaries. Some participants who engage in a healthy and active lifestyle addressed an ongoing discussion in the community regarding the perceptions on healthy habits and cultural authenticity. One participant noted that some people associated exercising and avoiding processed foods with being 'white'. However, she said, "I want them to realize it's our thing." These participants felt that their approach was at least as much a part of traditional culture as that of their critics.

Returns. Another group of participants struggled to engage with the community in a different way. Returning to the area after many years of living elsewhere, they

sometimes felt a lack of connection with the community at large. This felt particularly isolating for them because often they had returned in response to an illness or death in the family. The impact of these challenges on food decisions was addressed in participants' statements regarding life stressors.

Planning. Those who were most consistent in maintaining a healthy lifestyle were very successful at planning ahead, though this planning took different forms from person to person. One very health conscious participant planned her schedule based on the seasons and obtaining the natural sources of food that were important to her and fit within traditional culture. Others planned by having set timeframes for getting and preparing food—they went to the store with a list. Having healthy ingredients on hand allowed them to prepare quick, healthy meals like steamed vegetables, especially when time was tight. Another participant packed foods with her so that if there were only unhealthy options available, she would still have something healthy to eat.

Awareness. Not only did the map-making process provide useful information to the researchers, but in some cases they provided participants with meaningful insights to their own eating and purchasing habits. Several participants also stated that their maps made them realize how much they were eating out at restaurants. Some recognized this to be problematic because of its financial implications, while for others it was problematic because of the health impact. After looking at her map, one participant realized that she spent the most money on food in places that were not the most important food sources for her. She was interested in finding ways to match her spending to her priorities.

Individual health concerns also motivated some people to change their food choices, however this did not result in dramatic weight loss or changes in exercise habits to the same extent. Some participants discussed decisions to avoid or eliminate soda or fast food from their diets. Several participants felt the Pre-Diabetes group or the diabetes care they received through the clinic were helpful in identifying simple changes to improve the healthfulness of their diet and connect with others with similar experiences.

Many participants endorsed a desire to be more connected to traditional means of food procurement and preparation. One participant, who retained the traditional diet and lifestyle, planned her food activities on the seasonal harvests. She utilized her years of knowledge and experience in determining the exact quantity she required until the next harvest, thus only taking the amount needed. Some individuals wished to be more connected to traditional sources and expressed they

had the knowledge to do so, but were constrained by time limitations. One participant was creative in trying to connect the modern and traditional methods, by using YouTube videos to teach herself gardening techniques. Many of the participants mentioned having natural sources of food (e.g. venison, fish, berries, maple syrup, wild rice) that either they or their families obtained. Typically, these foods were not obtained in amounts that were sufficient to comprise the majority of a person's diet, but participants expressed their preference for the taste and the social aspect, such as family gatherings, of procuring these traditional foods. Canning is a traditional means of food pReservation in which several participants expressed specific interest and desire for more knowledge.

Understanding the priorities of community members in their food decision-making is vital to developing effective strategies to improve community health. Evaluating the ability of participants to make food decisions according to their wishes and understanding the implications of participants' statements will guide research and future programmatic interventions.

Discussion

Interactions with the Food System

Generally, participants felt unconstrained in their ability to make food decisions, and able to access stores and acquire food in accordance with their preferences. This finding challenges the common perception that Reservations are areas of high food insecurity. Most participants were able to purchase, prepare, and store foods of their choice without perceptible challenges or impediments. Those who would change how they ate if they had more money, typically suggested relatively small changes in their eating habits—like, incorporating more organic produce—rather than major changes in the content of one's diet (e.g. changing a snack from chips to carrots).

Our study design focused on understanding the factors influencing participants' desired food decisions and actions in maintaining and/or achieving a healthy lifestyle. Thus, we focused on addressing limitations participants felt in making the desired food choices, rather than judging the quality or healthfulness of those decisions. Further exploring the healthfulness of diets will be vital from a programming perspective. First, such understanding will be necessary to determine if and for whom further nutrition and dietary education is needed. Second, and more importantly, attracting participants for a behavior change campaign will be challenging if high-priority participants do not perceive that their food-related behaviors need to change.

On the whole, participants' noted surprisingly few barriers to their desired food decisions, and most felt they were able to choose, purchase and eat foods as they wished. This suggests that inability to access healthy food is not a primary factor in high rates of diabetes, obesity, and heart disease and that other potential exacerbating factors should be explored. It is noteworthy that FDL is perhaps unique among Reservation communities, which are often in rural, remote areas, because of its close proximity to a town with several large grocery stores. Furthermore, the FDL community addresses food access challenges through the Fond du Lac Transit system and by maintaining a strong social services system.

Though few people interviewed perceived challenges to physically accessing grocery stores, this may be a more common problem in the broader community. In spite of high reported rates of poverty within the community, for the most part, those who expressed some financial limitations felt the impact on their decisions was relatively small. However, further understanding of the composition of community member's diets would be enlightening, as Radimer, et al. (1992) noted that those who cannot afford unlimited food, typically and unsurprisingly cut quality before cutting quantity of food.

Almost all participants felt that at least one capital form - human, natural, or social - allowed them greater flexibility in making desired food decisions. Participants lacking in financial or physical capital used one or more of these asset types to create an adaptive and more resilient food system that allowed them to continue with their desired food decisions despite perceived limitations. Adaptive interactions with the food system allowed people to not only increase the amount of healthy food they consume, but to also build social capital that can be used to protect them in the face of future challenges. These adaptations are important because they emphasize that people will not wait for interventions to help them make their food systems work. They will actively create strategies and systems to meet their needs.

Some participants also acknowledged the importance of existing programs in helping their food decisions. One participant expressed appreciation for the social support found in the pre-diabetes group, while another welcomed the suggestions for easy substitutions that can cut calories and improve the nutritional value of food. Another participant, who is currently diabetic, expressed high levels of satisfaction with the care received in the clinic. Several others spoke favorably about Gitigaan programming, and expressed that they frequently use tilling services, and the seeds, and seedlings provided.

Food Access

Food access consists of three main components physical, economic, and attitudinal. Most people did not explicitly identify any of these as limitations to their food access. Economic limitations were most common by those who perceived such barriers. Though some participants faced attitudinal barriers to healthy eating, participants did not express that they were unable to access their preferred foods in local stores. Access did not play a prominent role in discussions of food systems and decisions. As such, interventions designed to increase access to healthy foods alone, without ancillary programming will probably have minimal impact.

Beyond the ability to make their desired food choices, participants illuminated other important aspects of their food systems. Many participants emphasized the importance of wild and natural food sources. The importance of these food sources was primarily socio-cultural. However, because traditional, natural, and wild foods have such importance to community members and because these foods are among the healthiest available, reaching out to community members to provide further skills and resources may represents an important point of entry for modifying eating habits.

We anticipated that food access would pose more challenges to community members than we found. We attribute this unexpected finding to the geography of the Reservation in combination with public transit services, which allow most people to get to a grocery store without too much difficulty. Similarly, limited use of convenience stores was unexpected. Though participants may have underestimated their use of convenience stores, it is also likely that many participants do not utilize convenience stores extensively because of the close proximity to grocery stores. Many of the lower income participants we spoke with lived in Brookston, a district that lacks a convenience or grocery store. For these participants, the difference between being dropped off at Fond du Lac Gas & Grocery and Super One is minimal.

Surprisingly, few community members mentioned time as a barrier to making food decisions as they wished. While many were busy with family and job commitments, most participants felt they had the time required to prepare food they wanted. It is unclear whether this is because people typically prepare convenient foods or because they have strategically integrated food procurement and preparation into their daily routines.

Fond du Lac-Specific Factors

Cultural factors may also shield community members who are considered vulnerable in other communities. Typically, in areas with limited food access

children, elderly, and the disabled are most vulnerable. However, in the FDL community, high regard for elders results in high levels of food security. Not only does the Elderly Nutrition Program provide daily meals at the Tribal Community Center, but it also delivers meals to the homebound. Elders can also request game meat from the Natural Resources Department, but are often gifted with it by community members. Beyond elders, there exists a sense that even if one does not have a lot to give, one should share what little one has with a person in need. This creates another social safety net within the food access realm.

Though most people were comfortable operating within their food systems, the interview process revealed common scenarios that can have a major impact on food decision-making. Grief and loss interfere with the ability and desire to obtain and prepare food. High levels of stress interfere with appetite and well being at an even more basic level. The conversations did not address substance abuse directly, however, based on discussions with other community members, the impact of substance abuse on family structures and on family financial resource management cannot be overstated. Not only does the stress of a family member's self-destructive behavior interfere with one's ability to focus on his/her own well-being, but the amount of money spent on drugs and alcohol likely affects family budgets, drawing resources away from food, rent, bills, and other necessities of daily life.

The FDL community has created a wonderful structure of social support that can mitigate some of these challenges. Through substance abuse treatment programs, mental health care, and supplemental food programs, the community supports vulnerable individuals during times of need. However, community support, though helpful, cannot fully resolve the grief, loss, and stress experienced by members.

FDL Reservation's geographic location and its strong social and cultural support structures shield it from the food insecurity faced by many other Reservations. Despite this, Reservation members struggle with high rates of obesity-related diseases. It is reassuring that participants' of our study perceive that they are able to access and purchase foods as they wish. However, this poses a new set of challenges as interventions to strengthen community health and food system are designed to address community members' knowledge and motivation. Areas for future exploration and evaluation and potential programming recommendations are described below.

Recommendations

Evaluating perception versus reality

- It will be important to understand whether desired food choices/behaviors are, in fact, healthy food choices. Most participants did not perceive significant barriers to their desired food choices/behaviors, suggesting that they do not necessarily see a need for change. The need to align perception with reality becomes particularly important in light of Fila and Smith's study (2006), which demonstrated a notable gap between expressed dietary priorities and the reality of participants' actual diet. It may also be worthwhile to explore food choices in larger segments of the population.
- Create surveys that examine the content of community member's diets and quantitatively measure food insecurity (e.g. skipped meals, food shelf utilization, difficulty reaching the grocery store, or difficulty affording foods) to corroborate or refute our findings will be helpful to guide future interventions.
- Based on discussions with staff that provide some of the local programming, there is some concern that perceived food and cooking knowledge, skills, and behaviors do not match actual knowledge, skills, and behaviors. Addressing this disconnect will be critical to reaching high impact/priority targets with interventions.
- If participants are eating unhealthy foods, but perceive no issues in their eating habits, a general community-wide education campaign may be beneficial to raise awareness of the benefits of healthy food choices.

Considerations for Future Intervention Strategies

- Because traditional, natural, and wild foods have such importance to community members and because these foods are among the healthiest available, reaching out to community members to provide further skills and resources may provide a point of entry in modifying eating habits.
- Most participants do not express difficulty obtaining fruits and vegetables. Because of this, Farmer's Markets are less likely to have a major impact on access to healthy foods. However, they may serve other valuable functions, such as a means to connect with others pursuing a healthy lifestyle, a venue for health education, or a place to connect socially and culturally with vendors who sell traditional handicrafts.
- Parenthood is an important motivator for changing behaviors and engaging in a healthy lifestyle. Interventions targeted at pregnant women and new parents are likely to have a greater impact, not only because they reach out to adults at a time when they are open to change, but also because it can affect and shape the habits of children. Clearly, parenthood is a major transformation in a person's life that opens people up to teachable moments. Are there other critical windows for change in the community that could be targeted to maximize program impact?
- In order to maximize the effectiveness of programming, interventions should be aware of the impact of major life stressors on food decisions, and when possible provide coping strategies. Consider collaboration with existing programs such as grief counselors and substance abuse treatment groups to enhance people's abilities to cope and adapt.
- Both those who coordinate and those who participate in programs noted many competing programs and demands on their time that prevented them from attending classes and programs in which they were interested. The wide variety of programs offered may benefit from targeting recruitment to high priority groups and individuals.
- Consider developing a comprehensive review of programs and services that are directly or indirectly involved with food, to look for areas of duplication of efforts and areas of synergistic cooperation.
- Efforts to strengthen human, social, and in particular, natural capital, for those who do not have reliable access to these capitals is likely to increase resilience and adaptability, especially in light of financial limitations.
- Consider promoting a cooking club as a follow up to pre-diabetes group, some participants in the group seemed unaware of existing related activities through which they could gain additional information and support.
- Make nutritional information for Elders Nutrition Program (ENP) meals available to allow for informed decision making and learning about label reading in a familiar environment.

- Consider collaboration between clinic dietician and ENP, to improve the nutritional content of provided meals and improve the nutrition knowledge of program participants.
- Compile recipes, gardening, and foraging resources in one place for ease of use. This may be as a resource library available locally through Thirteen Moons or a blog or RSS website.
- Thirteen Moons should strengthen the link between the traditional cultural practices they teach and their health impacts. Additionally, this could facilitate a conversation about how the community can maintain cultural authenticity while pursuing and encouraging healthy, active lifestyles.

Limitations

Though our approach provided insights into the food systems of individuals in the Fond du Lac community, those insights may not represent the experiences of the broader Tribal community.

Many of the participants in our conversations demonstrated a high level of interest and engagement with the food system. Individuals attracted to and willing to participate in discussions about the food system may be disproportionately more aware of food system concerns or more engaged food decision-making processes.

Despite substantial recruitment efforts, only three participants from the food distribution program (Group 2) participated in both the mapping and Sondeo. Substantial effort was put into recruiting low-income individuals, as they are generally most likely to be vulnerable or food insecure. Specifically, recruitment efforts targeted recipients of commodity foods. We had no means to specifically recruit recipients of EBT (Electronic Benefit Transfer), and thus only one participant mentioned EBT funds as part of their food budget.

Recruitment through community contacts led to some unintentional narrowing of the sample population with whom we spoke. For example, all participants that were working at the time of the interview either worked for the Tribal Community Center or for the Clinic. We did not capture the experiences of those working at the Black Bear Casino Resort or others working for non-tribal employers, who may not have the same level of financial security. Similarly, only one participant in the mapping process and no participants in the interviews were male. Though women are often the household food decision-makers, this suggests that we have missed the perspectives of households where men are the food decision-makers, where men are single parents, or where men live alone. Their experiences operating within the food system may be substantially different. Recruiting those who were homebound either due to health conditions or lack of transportation was attempted through customized flyers for the Elderly Nutrition Program, but did not result in any participants. These members of the community are at the highest risk of food insecurity in most communities, and understanding their experience in the context of a culture with a high level of respect for elders would have given us a greater understanding of whether this population was in need of further services or interventions. Because many participants were recruited through our community contacts, our participants may have been relatively healthier, wealthier, or more socially connected than many in the community. This likely limits our understanding of the experience of the majority of the community as well as interventions that would be appropriate for addressing the concerns of the majority of the community.

Our approach to understanding food systems had some intrinsic limitations. It was difficult to maintain consistency in assessment of participants across the eight-person interview team. It was similarly difficult to ensure that the assessment scale

was used to assess participants in isolation, and not in scoring participants relative to one another.

In our discussions after the interviews, one particular area that lacked clarity was distinguishing whether a garden fit primarily as natural or physical capital, or a mix of both.

Particularly challenging was maintaining consistency in evaluating people on their perceived efficacy versus the interviewer's perception of their efficacy of operating within the food system, and in evaluating this efficacy in terms of desired food versus healthy food.

Modifying the Sondeo method into a non-immersion approach limited the ability to discuss findings while conversations were fresh in team members' minds. This probably limited ability of the group to adapt throughout the process and the depth of group analysis.

Conclusions

Examining the community food system is critical to understanding the existing patterns of food behavior. It provides insight into the ability of community members to access food and make their preferred food-related decisions.

For this purpose, our study used a community-based, participatory process to examine the FDL Reservation's food system to identify and examine factors that enhanced or inhibited participants' desired food choices. Overall, we found that most participants did not feel limited in their ability to make preferred food choices. The majority of these participants were able to regularly access grocery stores, thus limiting their reliance on convenience foods as a frequent food source. Those that did feel constrained in making their preferred food decisions, expressed lack of financial and/or physical capital as the key limitation. However, these community members compensated for shortcomings in one capital by utilizing and leveraging other capitals.

While Native American Reservations are often considered to be food deserts, areas with limited access to healthy food options, our study suggested that this isn't the case in FDL. Participants did not perceive access to healthy food as a notable barrier to making desired food decisions. Community members did not feel impeded in making their desired choices due to the lack of access of healthy foods. This suggests that improving access to healthy food in isolation will not have a significant impact on community health and wellness.

Based on these findings, specific areas for future research have been suggested which involve determining how healthful current food choices are amongst FDL community members, and how closely their actual food choices resemble their perceived food choices. Programs such as farmers markets or community gardens

are likely to be more effective in changing eating habits if they are linked to building healthy social connections, education on ways to use healthy foods, or increasing desire to eat foods that one has spent the effort to grow. Because our participants cited children as an important motivator in driving lifestyle change, programming targeted at new parents will likely influence not only these adults, but their children as well. As participants identified natural and traditional food sources as most important socio-culturally and overall, additional programs that are directed at connecting community members with traditional food procurement and preparation methods may be highly effective in engaging the community in pursuit of healthy lifestyles. These strategies can help move the community toward a better understanding of how and why people make decisions regarding nutrition and health and maximize the impact of future resources and programming.

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Appendices

Appendix A. Instructions for Map-making Participants

Introduction paragraph:

Welcome to this food system mapping session. Thank you for participating. Before we start, I want to make it clear that your participation is voluntary and that you are not required to respond to any questions that you are not comfortable with. Also, you should have received your gift card. If for some reason you have not we can work it out after the session.

Our goal today is to start to get a better understanding of where and how food is accessed by members of the FDL community. Rather than us going around to look at what food sources are out there - in terms of stores, markets, and other things - we want to hear directly from community members about the sources of food that are important to you, the ones that you use. For the most part, we know what is out there or can find out by looking around. You are not responsible for being a tour guide -- telling us what is out there, making sure we know what's around, although we fully expect to learn some new things about that from you. Instead, we'd like you to create a personal food system map, made up of the places that are used by you, that are important to you, in terms of food. We will help you do this by providing a few pretty straightforward instructions that will help us to be able to understand your map, even though you are the ones creating it in your own styles. They are your maps. Make them in a way that reflects the way you see your community, life, etc. Don't feel that there is a right way, that they have to be pretty or artistic, or that we need to see certain things: we don't. In the end, we just need to be able to understand them. That is why we are asking you to follow the few steps that we have created.

Social or cultural:

Food sources that are important not for the amount of money you spend, number of visits that you make, or the quantity of food you get. Food sources that are important for some other reason

Color Indicator	***Indicator 2***	***Direction***
n/a	n/a	Read the Introduction statement to the group
		ID CODE: on the backside of your paper in the lower right corner, please write the code
	Mixed media	Add some features that "define" your map (places, roads, natural, landmarks, etc.)
	Circled H	Indicate where you live.
		Come up with a plan to accommodate overflow space
		Designate a space where you can have a secret (place or practice).
	Circled - H	Designate a space for your map key…Home code and then add anything that you might have used
	T1:	Primary mode of transport
	Media	Give permission to add to map as needed throughout process
		Scripted placements ('Indicate' or 'add and indicate') with ranking element
Green	Circle	Indicate the 3 top food sources in terms of money spent +KEY
Green	Star	Indicate the #1 with the GREEN star
Orange	Circle	Indicate the 3 top food sources in terms of quantity of food acquired +KEY
Gold	Star	Indicate the #1 with the GOLD star
Yellow	Circle	Indicate the 3 top food sources in terms of frequency of visits per week, month or year +KEY

Blue	Star	Indicate the #1 with the BLUE star
Pink	Circle	Indicate up to 3 food sources in terms of social or cultural considerations +KEY
Red	Star	Indicate the #1 with the RED star
Silver	Star	Indicate the most important food source overall, whether for the measure given or another of your own. + KEY
		Unscripted placements
White	Circle	What is missing? Add food related places that you might have not thought of or that did not get covered by the previous steps. +KEY
	Mixed media	What is missing? Add any other places that you might have not thought of or that you'd like to include in your final map
	Highlighter	Identify and label three "main routes" that you regularly travel. +KEY

Appendix B. Food System Rubric

Scale Methodology:
The 1-5 scale used for each type of capital is loosely based on a framework in which the scoring criteria were generated as follows:

Blocks	***Impedes***	***Neutral***	***Enables***	***Enhances***
Person perceives that the absence of access to or use of this capital type, in effect *blocks* desired food decisions and actions.	Person perceives that limited access to or use of this capital type creates barriers that *impede* desired food decisions or actions.	Person perceives that this capital type has little to no influence on food decisions and actions, i.e. decisions are driven primarily by preferences and priorities	Person perceives that access to and use of this capital type *enables* personal food decisions and actions.	Person perceives that access to and use of this capital type *enhances*, or greatly enables, personal food actions and decisions.

In the "capital-specific" scale definitions, we have included sample profiles. After these definitions, we have included some examples of each type of capital to ensure that all types of capital have been discussed. If certain areas have not been addressed, please consider asking more specifically about that type of capital or using the prompt questions included below.

Please remember, these ratings are based on the participants' perceptions on whether or not they have limitations in accessing and utilizing each type of capital. For example, two different people may feel very differently about how effective they would be if they were left in the woods with a pocketknife.

Initial prompts:

- Please describe your food map and some of the food decisions and actions that you make.
- Tell us about some of the food decisions that you make and why?
- How do you decide where to get your food?
- How do you decide which food to get?
- How do you decide which food to eat?
- How do you decide what food to buy?

Physical Capital
Definition: The basic infrastructure, equipment and goods needed to obtain, process, and prepare healthy food.

Possible Prompt Questions:

- How do you get to the store?
- What equipment do you use to prepare meals?
- What equipment do you use to get food?
- Do you get food from anywhere else besides the store?

Profiles

Blocks	*Impedes*	*Neutral*	*Enables*	*Enhances*
A person at this level does not have transportation or food preparation equipment. This limits his/her ability to obtain and prepare healthy food. Examples include a person who lives in a hotel with a mini fridge and a microwave, one spoon and one fork and cannot cook food there or a person who often cannot find transportation to a healthy food source.	A person at this level is capable of using physical capital, but is limited by external factors. Examples may include a person who is limited in the amount of food they can buy at the store because they can only buy as much as they can carry on the bus or their bicycle or a person who knows how to hunt, but either does not have the equipment or does not know where to hunt.	A person at this level has transportation and necessary equipment, but does not feel that access to this equipment impacts their decisions about food. Examples may include or a person who has a stove, but does not use it to prepare food because of his/her food preferences or priorities or a person who has the equipment with which to go fishing, but does not fish because he/she does not like the taste of fish.	A person at this level feels that their access to transportation and equipment helps them obtain and prepare healthy food. Examples may include a person who has the necessary cooking equipment, but may wish to have other appliances like a food processor or blender to increase their efficiency or a person who has or can borrow the equipment he/she needs to maintain a garden.	A person at this level feels they are able to use transportation, and food procurement and preparation equipment strategically in pursuit of a healthy lifestyle. Examples may include a person who can obtain organic produce whenever they wish to or a person who through creativity or access to tools can prepare any meal they wish.

Examples of Physical Capital

Food Procurement	**Food Storage**	**Food Preparation**
Access to fishing or hunting gear Access to maple syrup tapping equipment Has a car, bike, boat or other mode of transportation Access to gardening equipment and other gardening needs Roads that are safe to bike or walk on Roads that are passable even in difficult weather conditions	Secure shelter Functional kitchen Has a refrigerator at home Root cellar Other items to consider: canning jars, food dehydrator	Has a stove at home Access to clean, affordable energy Adequate water supply and sanitation Other items to consider: fork, knife, blender, microwave, pans, Tupperware, pantry, etc.

Human Capital
Definition: Represents the skills, knowledge and abilities necessary to obtain and prepare foods necessary for a healthful diet.

Prompt Question:

- What skills are valuable for obtaining food? How confident are you in your ability to do [said skill]?
- What are some of the important skills for making food? How confident are you in your ability to do [said skill]?
- Do you cook often?

Blocks	***Impedes***	***Neutral***	***Enables***	***Enhances***
A person at this level lacks the knowledge and skills necessary for practicing a healthy diet and therefore fails to have one. Examples may include a person who does not know which foods are nutritious or a person who does not know how to maintain a garden.	A person at this level feels that they know which foods are healthy and/or have the skills needed to obtain healthy foods, but are limited from doing so. Examples may include a person who would like to eat fresh vegetables, but cannot obtain them as often as they would like through the commodities program or a person who does not know which areas are good for fishing.	A person at this level sees him/herself as being knowledgeable about healthy foods, but does not feel this knowledge impact his/her decisions and actions. Examples may include a person who knows which foods are nutritious but for various reasons chooses to eat other foods instead or a person who knows how to prepare foods, but eats pre-packaged or processed foods instead.	A person at this level feels that his/her knowledge about healthy and skills in obtaining and preparing it helps him/her make healthy choices. Examples may include a person who prepares a healthy meal at home at least twice weekly or makes food-purchasing (obtaining) decisions based on the healthfulness of food.	A person at this level sees himself or herself as having the needed knowledge, skills, and physical wellness to obtain and prepare a healthy meal. Examples may include a person who feels very confident and competent in their ability to garden and to include food from their garden in meals or a person who can hunt, clean, and store a deer and prepare a meal with it.

Examples

Knowledge	**Skills**	**Abilities**
Able to identify healthy foods Has knowledge of recipes for several different meals Can tell which fruits and vegetables are ripe, spoiled Knows appropriate sites/times for hunting, fishing and gathering Able to identify local wild edibles Knowledgeable about local plantations for crops and home garden yields	Cooking Gardening Canning Dehydration and Smoking Hunting Fishing Gathering Farming and/or harvesting Cleaning a deer, moose, etc. Maple syrup tapping and collection Composting	Physically well enough to shop for groceries Physically well enough to preserve and cook food Physically well enough to partake in outdoor activities such as hunting and gardening Can navigate public transportation, if needed

Natural Capital
Definition: The natural resource stocks from which food can be obtained, including the atmosphere, trees, land, and bodies of water.

Prompt Questions:

- Do you obtain food from natural sources?
- What foods do you obtain from natural sources?
- Where do you go to interact with nature?

Blocks	***Impedes***	***Neutral***	***Enables***	***Enhances***
A person at this level feels that lack of access to natural capital significantly limits his/her food choices. Examples may include a person who lives in an apartment and does not have the ability to use family or public land or a person who person who lives in an area where natural resources are not usable due to contamination, safety, or other problems.	A person at this level feels that lack of access to natural capital somewhat limits his/her food choices. Examples may include a person for whom distance to a natural resource limits their ability to regularly utilize it or a person who sometimes cannot access natural capital due to health conditions such as asthma or allergies.	A person at this level feels that access to natural capital does not meaningfully limit or enhance his/her food choices. Examples may include a person who lives in the woods, but does not utilize food sources available there and instead purchases food from the grocery or convenience store or a person who doesn't enjoy spending time outdoors.	A person at this level has access to a wide range of natural resources and feels that use of them enhances his/her food options. Examples may include a person who knows how to garden, but does not have a means of preserving garden products or a person who knows how to prepare berries or mushrooms, but does not know where to find them.	A person at this level has access to a wide range of natural resources and extensive resources for their utilization. Examples may include a person who knows where to find berries or mushrooms and can take them through the entire process from collection to consumption including pReservation and preparation, or a person who knows how to access and use many different resources in a lake including, but not limited to fish and wild rice.

Examples

Divisible Assets	**Public Goods**	**Hazard Prevention**
Land Forests Marine resources Wild resources Water channels/bodies	Air quality Biodiversity, degree and rate of change Local soil quality	Erosion protection Waste assimilation Storm protection

Financial Capital
Definition: The financial (cash or barter) resources available to obtain, produce, and prepare food.

Prompt Questions:
Do finances influence your food choices in any way? If so, how?

Blocks	***Impedes***	***Neutral***	***Enables***	***Enhances***
A person at this level lacks access to this capital and does not have contingency plans. Examples may include a person who works at a fast-food establishment and takes home food from work or subsists on fry bread.	A person at this level feels that the lack of access is a limiting factor but he/she has a contingency plan. Examples may include a person whose children receive free lunch at school or participates in the commodities program.	A person at this level does not feel he/she has significant financial constraints on food choices. Examples may include a person who buys some food from the convenience store and some from the grocery store, but the decision between the two is not based on financial resources.	A person at this level has enough income or tradable goods that it makes food related decisions easier. Examples may include a person who feels they can buy fresh vegetables from the supermarket or farmer's market whenever they want.	A person at this level feels they have the resources and budgeting skills they need and that their access to financial resources makes food decisions much easier. Examples include a person who maintains a household budget and knows what percent of their income is spent on food or a person who trades with friends and family to create a balanced diet.

Examples

Immediate Availability	**Delayed Availability**	**Loans**
Cash Savings State Aid Remittances Barter items	Investments Jewelry Livestock Pensions Life Insurance	Loans Credit Microfinance

Social Capital
Definition: The social resources upon which people draw to obtain and prepare healthy food, including friend and family support and community networks.

Prompt Question:
Are there people in your life who have an impact on your health? If so, how?

Blocks	***Impedes***	***Neutral***	***Enables***	***Enhances***
A person at this level is a person who does not have social support in the community. Examples may include a person who does not know who they would turn to in times of need or a person who is unaware of existing community groups.	A person at this level is a person who feels that lack of social connectedness limits his/her food choices. Examples may include a person who wishes to participate in traditional means of food collection but is not socially connected to groups that engage in this or a person who feels that his/her family's unhealthy food behaviors negatively influence his/her own decision-making.	A person at this level is a person who does not feel that social capital significantly enhances or impedes his/her food choices. Examples may include a person who has family in the area, is not especially close to them, but is not bothered by this or a person who does not feel they benefit significantly from the Pre-Diabetes group.	A person at this level is a person who participates in family and community activities, but may not feel comfortable directing activities or communicating personal needs. Examples may include a participant in the Pre-Diabetes group and feels that this has helped them in making decisions about food or a person who joins a group in gathering wild rice and appreciates that connection to the food system and traditional culture.	A person at this level is a person who feels well connected to family, friends and community groups and feels comfortable calling on those people for support in leading a healthy lifestyle. Examples may include a person who organizes a potluck for friends and family or coordinates a group going fishing.

Examples

Family	**Friends**	**Community**	**Benefits of Social Capital**
Feels family is supportive of a healthy lifestyle Has family in the area	Feels friends are supportive of a healthy lifestyle Has someone who can give a ride	Awareness of available community health services Feels workplace is supportive of a healthy lifestyle Has a person they consider a mentor in the community or someone who they mentor Membership in community or clinic health group (e.g. prediabetes group) Group nature and quality of interactions	Risk management and social insurance Better management of common and shared resources through group action Reduced costs of conducting business Increased capacity to innovate Improved access to information and services

		Awareness of outdoors-oriented community groups	Greater influence over local policies and legislation

Appendix C. Modified Sustainable Livelihoods Approach Framework

Capitals	Sustainable Livelihoods Framework	Contextualized Food Systems Framework	Simplified Food Systems Framework
Physical	Comprises of the basic infrastructure and producer goods needed to support livelihoods. Infrastructure consists of changes to the physical environment that help people to meet their basic needs and to be more productive. Producer goods are the tools and equipment that people use to function more productively.	Comprises of the basic infrastructure and "*producer goods*" needed to support a healthy diet/healthy eating. Infrastructure consists of changes to the physical environment that help people to meet the requirements of a healthy diet. "*Producer goods*" are the tools and equipment that people use to procure, process and prepare healthy food	The basic equipment and goods needed to obtain, process, and prepare healthy food.
Human	Represents the skills, knowledge, ability to labor and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives.	Represents the skills, knowledge, ability to labor and good health that together enable people to procure, process, and prepare healthy foods and consume a healthy diet.	Represents the skills, knowledge and abilities necessary to obtain and prepare foods necessary for a healthful diet.

Natural	The natural resource stocks from which resource flows and services (e.g. nutrient cycling, erosion protection) useful for livelihoods are derived. There is a wide variation in the resources that make up natural capital, from intangible public goods such as the atmosphere and biodiversity to divisible assets used directly for production (trees, land, etc.).	The natural resource stocks from which foods *necessary* for a healthy diet are derived. There is a wide variation in the resources that make up natural capital *in a food system*, from intangible public goods such as the atmosphere and biodiversity to divisible assets used directly for production (trees, land, etc.).	The natural resource stocks from which food can be obtained, including atmosphere, trees, land, and bodies of water.
Financial	Denotes the financial resources that people use to achieve their livelihood objectives. The definition used here is not economically robust in that it includes flows as well as stocks and it can contribute to consumption as well as production. However, it has been adopted to try to capture an important livelihood building block, namely the availability of cash or equivalent, that enables people to adopt different livelihood strategies.	Denotes the financial resources that people use to obtain and prepare food. It can contribute to consumption as well as production. However, it has been adopted to try to capture an important means of obtaining food, namely the availability of cash or equivalent, that enables people to consume a healthy diet.	The financial (cash or barter) resources that are available to obtain food.
Social	The social resources upon which people draw in pursuit of their livelihood objectives. These are interrelated and broadly developed through: networks and connectedness, membership of more formalized groups and relationships of trust, reciprocity and exchanges.	The social resources upon which people draw in pursuit of a healthy diet. These are interrelated and broadly developed through: networks and connectedness, membership of more formalized groups and relationships of trust, and reciprocity and exchanges.	The social resources upon which people draw to obtain and prepare healthy food, including friend and family support and community networks.

Modified from DFID (2001)

Appendix D. Interviewer Evaluation form

FDL FOOD SYSTEM SONDEO

DATE: _____ INTERVIEW CODE:_____ YOUR INITIALS: _____

STEP I: GENERAL NOTES (BRAIN DUMP)

Reflection 1. What factors* did this person perceive as enabling his / her desired food-related decisions or food-related actions? (*Knowledge, skills, resources, relationships, etc.)

Reflection 2. What factors*, absent or present, did this person perceive as impeding his / her desired food-related decisions or food-related actions?

Reflection 3. In what way, if at all, did this person discuss the concept of time in relation to his/her desired food-related decisions or food-related actions?

Draw upon your notes (p.1) and reflections (p.2) to classify the various factors that the participant perceived as enablers or impediments to his or her desired food related decisions or actions. Attempt to classify these factors or thoughts into the five types of community capitals indicated on this page.

HUMAN Capital	**FINANCIAL Capital**
PHYSICAL Capital	**NATURAL Capital**
SOCIAL Capital	**TIME**

Assessment:

Use the following descriptions to assess the role of each type of capital in the participant's perceived food decisions and actions.

"Blocks"	"Impedes"	Neutral	"Enables"	"Enhances"
Person perceives that the absence of access to or use of this capital type, in effect, *block* desired food decisions or actions	**Person perceives that limited access to or use of this capital type creates barriers that *impede* desired food decisions or actions**	**Person perceives little to no influence of this capital type on food decisions and actions; i.e., decision are driven primarily by preferences and priorities.**	**Person perceives that access to and use of this capital type *enable* personal food decisions and actions.**	**Person perceives that access to and use of this capital type *enhance*, or greatly enable, personal food decisions and actions.**

Circle the most appropriate term for each capital and for time.

HUMAN CAPITAL

Blocks	Impedes	Neutral	Enables	Enhances

FINANCIAL CAPITAL

Blocks	Impedes	Neutral	Enables	Enhances

PHYSICAL CAPITAL

Blocks	Impedes	Neutral	Enables	Enhances

NATURAL CAPITAL

Blocks	Impedes	Neutral	Enables	Enhances

SOCIAL CAPITAL

Blocks	Impedes	Neutral	Enables	Enhances

TIME

Blocks	Impedes	Neutral	Enables	Enhances

Appendix E. Locations Mentioned on Participants' Maps

Natural/ Wild Food Sources	Restaurants	Grocery Stores	Family	Public Food Program	Convenience Stores	Local Farm/ Farmer's Market	Other
Home Garden	Street Car.	Walmart	Parent's House	Comm-ods	B&B	CSA Farm Pick Up	Barbecue/Camping
Mahnomen	Black Bear Casino	Super One	Home	ENP	Gas Station	Community Garden	Tribal Center
Big Lake	Gordy's	Grocery Store	Grandparent's House		G&G	Grass Fed Beef	Community Center
Ditch Bank	McDonald's	Sam's Club	Baker's House		Holiday	Friend's Farm	Movies
Family Hunting Shack	Panda Chinese	Whole Food	In Law's House		Superior Meats	Wrenshall Farms CSA	Duluth
Highway 2/ Fishing Lake	Carmen's	Target	Bruce's		Convenience Store	Farmer's Market	School
Fond du Lac Reservation (Natural Source)	Subway		Child's Home		Stop and Go		Work
Grand Portage Reservation (Natural Source)	Pizza		Cabin Solon Springs		Little Store		Ojibwe School
Netting	Mexican Lindo				Walgreens		Grandma Cindy's Daycare
Deer Meat	Duluth Jade Fountain Mall Food Court						Schwann's Central Enterprise Club
Leech Lake Reservation	Hong Kong Warming House						
White Earth Reservation (Natural Source)	Hanabi Sushi						
Perch Lake	Miller Hill Mall						
Rice Lakes	Southgate Pizza						
Field by House	Amazing Grace						
Bass Lake	Duluth Grill						
Visit Mount.	Blackwoods						
St. Louis River	Pizza Hut						
Wild Onions	Perkins						
Maple Sap Fish	Arby's						
Home Apple Tree	Dairy Queen Restaurant						
Strawberries							
Blueberries							
Redby							
Raspberries							

Appendix F. Original Project Proposal

Project Plan

Purpose and Aims

Honest initial efforts have been made to promote healthy, local foods in the Fond du Lac (FDL) Tribal community[a]. Yet often seeds remain unsown, plants unplanted, and fresh, healthy food, sometimes free and delivered, goes unrecognized and is sometimes even refused. Critical American Indian health indicators continue to trend negatively, especially among young adults (SDPI, 2010). Something is clearly missing from the diverse and sincere approaches to promoting healthy foods and lives. We assert that the deficit is adequate understanding, on the part of program designers and practitioners, of how food and food choices fit into the lives and livelihoods of FDL community members… ***of how community members actually connect and interact with the food system***. This project represents a modest but essential step toward overcoming this deficit.

The project's purpose is to ***positively influence FDL community wellness through increased adoption of healthy foods***. Our short-term project outcomes target this larger, longer-term impact by generating new and critical information that will enhance our understanding of the FDL community food system, particularly *as experienced from the food consumers' perspective*. The project provides public value by

- Generating new and necessary information about the FDL food system,
- Strengthening relationships and trust through participatory, community-based research,
- Presenting a model for participatory actions and interactions.

Our first aim is to better understand *how, when, and where FDL community members access food*. To answer that question we will use a participatory, community-based process to map the FDL food system from the food consumers' perspective. Our second goal is to better understand *factors that influence consumers' food access and consumption choices*. We will use a tested rapid and participatory community appraisal process to develop a basic but useful decision/action framework based on the community capitals approach. To inform and positively influence future work, we will evaluate the efficacy of the processes and interventions and will disseminate all information generated through this project with partners in the FDL and surrounding community. It will inform ongoing projects and future proposals targeting outcomes and impacts related to FDL and other Tribal food systems.

1. Map the food system from the consumers' perspective
2. Work with food consumers to develop a food decision/ action framework

Background and Rationale

FDL's Reservation is the nexus of an Ojibwe community with roughly 3800 enrolled members. The reservation boasts an approximate population of 1500, with about 2500 American Indians living within a 25-mile radius. It is adjacent to Cloquet (pop.11, 000) and near Duluth (pop. 85,000). The Reservation is an area of 'low income and high diet'- related deaths (Food Trust, 2012) and the community and University have invested substantial energy into building and strengthening individual and community connections with natural resources, including food. Throughout the year, the FDL Ojibwe Garden Program[b] grows and educates community members about Ojibwe crops, varieties, and production systems using its demonstration farm. The program distributes its

[a] *An overview of select food-oriented programs and project at Fond du Lac is presented in Background and Rationale*

[b] *A University of Minnesota – Fond du Lac Tribal & Community College partnership*

harvest institutionally, to FDL's Elder Nutrition Program, and directly to community members through a free food share and weekly free farm stand. In spring, the Gitigaan Program educates gardeners and distributes seeds and plants to Band members. FDL Master Gardeners[a] – the state's first non-county cohort – work with Tribal youth at a community center garden. The Thirteen Moons Program[a] provides year-round education about natural resources including maple sugar, wild rice, and other wild edibles and forest products. The Ojibwe School's Journey Garden targets students and the Band's various divisions sponsor environmental, health, and nutrition education.

Overall, there is strong *academic* understanding around what constitutes healthy food and its production and distribution. Far less clear, however, is why those most likely to benefit from healthy foods often choose not to purchase and/or consume them, even when available. Barriers go beyond access and availability. This reality was brought sharply into focus through FDL Ojibwe Garden's *free* food share pilot, where roughly one-third of participants in the program "dropped out" for no specified reason. Availability was not the issue, so then what was? It is essential that we begin to explore how a complex suite of factors, not simply access and availability, impedes healthy food choices. Moreover, we need to recognize the highly contextual nature of these impediments. Plainly stated: to understand and influence food choices at FDL we must invest in understanding specifics of the FDL food system context.

Activities and Methods

Participatory mapping, January – March 2013

Issue: *How is food accessed now?* We posit that *perceived* food systems frame and influence consumer strategies for food procurement and consumption as much or perhaps more than what actually exists. For example, a farmers' market may increase fresh food availability, but will only begin to lead to increased adoption of healthy foods when consumers actually perceive the market as a realistic food sourcing option. Barriers to the transformation from reality (*it exists abstractly*) to perceived reality (*it exists concretely, or for me*) relate to awareness, physical access, food knowledge, income, and several other factors.

Action:

- Recruit mapping team comprised of partners and community participants
- Conduct a training on participatory, community-based mapping (1 session)
- Participatory mapping sessions (3 sessions)

Deliverable:

- Report presenting community food system maps, methods for their development, and relevant educational materials on the FDL food system, both actual and perceived.

FDL Sondeo: developing a food "decision/action framework", February – May 2013

Issue: *Why do food consumers act as they do?* Adoption of healthy foods is complex; the sum of numerous decisions and actions related to resource availability and management, knowledge, lifestyles and, of course, food procurement, preparation, and consumption. We will give voice to FDL food consumers using the *Sondeo* method – a rapid, participatory assessment method demonstrated to be effective in the FDL context (Wilsey & Beaulieu, 2010). Information about food decisions and actions will be framed and analyzed using the "capitals and capabilities" framework (Bebbington, 1999), which explores capability as it relate to various capital endowments: natural, physical, social, financial and human.

Action:

- Recruit assessment team and community participants
- Conduct a Sondeo method training for the assessment (1 session)
- FDL food system Sondeo (3-4 days)

Deliverable:

- Report on FDL food consumers' decisions and actions that will include a community-based decision/action tool based on the capitals framework.

Evaluation

Project evaluation will be mainly summative and will target three areas. First, we will assess the validity of the maps and the decision/analysis framework through facilitated conversations with a subset of the original community participants. Additionally, we will use these conversations to learn about participants perceptions of the participatory methods used, in particular the value of involvement and any unintended benefits or costs. Finally, we will reconvene the core project team, upon conclusion of the project. This meeting will serve to debrief on the overall experience and to critique the processes used, ideally leading to recommendations for broader application within the organization.